CLAIMS

What is claimed is:

1. A method for packaging a coaxial optical component for use in fiber optic networks, the method comprising:

attaching an optical filter substrate to a collimating element;

connecting the collimating element with a dual fiber pigtail to form a dual fiber collimator such that a transmission loss of light between the collimating element and the dual fiber pigtail is minimized;

inserting the dual fiber collimator in a first end of a housing such that the dual fiber collimator is permanently secured within the housing.

2. A method as set forth in claim 1, wherein connecting the collimating element with a dual fiber pigtail further comprises:

aligning the collimating element with the dual fiber pigtail; and

securing the collimating element to the dual fiber pigtail using optical epoxy.

3. A method as set forth in claim 1, further comprising securing a plurality of spacers around the dual fiber collimator, wherein securing a plurality of spacers around the dual fiber collimator further comprises applying epoxy between the plurality of spacers before the dual fiber collimator is inserted in a first end of the housing, wherein the epoxy secures the dual fiber collimator and the plurality of spacers within the first end of the housing.

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4. A method as set forth in claim 3, wherein inserting the dual fiber collimator in a first end of a housing further comprises aligning the dual fiber collimator within the housing before the epoxy between the plurality of spacers cures using an alignment control, wherein light is directed through the dual fiber collimator onto the alignment control and wherein the dual fiber collimator is aligned within the housing when the light is directed onto a center mark on the alignment control.

5. A method as set forth in claim 1, further comprising subjecting the coaxial optical component to temperature cycling to release stress and stabilize the coaxial optical component.

6. A method as set forth in claim 1, wherein connecting the collimating element with a dual fiber pigtail further comprises connecting a collimating lens such as a GRIN lens with the dual fiber pigtail.

7. A method as set forth in claim 1, further comprising curing the optical epoxy.

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8. A method as set forth in claim 1, wherein the housing further comprises an extended portion that extends out from the inserted dual fiber collimator to accommodate other optical elements, further comprising:

inserting a second optical element within the extended portion of the housing;

aligning the second optical element with the dual fiber collimator that is already secured within the housing such that a transmission loss between the second optical element and the dual fiber collimator is minimized; and

securing the second optical element within the extended portion of the housing.

9. A method as set forth in claim 8, wherein the second optical element is a single fiber collimator, the method further comprising securing the single fiber collimator to the housing using optical epoxy.

10. A method as set forth in claim 8 wherein securing comprises soldering the second optical element within the extended portion.

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11. A coaxial optical component for use in manufacturing optical devices, the coaxial component comprising:

a collimating lens coupled to an optical filter substrate;

a dual fiber pigtail coupled to the collimating lens to form a dual fiber collimator; and

a metal housing, wherein the dual fiber collimator is inserted in a first end of the metal housing such that the metal housing is disposed about the dual fiber collimator.

12. The coaxial optical component as set forth in claim 11 further comprising a plurality of glass spacers disposed about the dual fiber collimator, wherein the metal housing is securely attached to the plurality of spacers with optical epoxy.

13. The coaxial optical component as set forth in claim 11, wherein the collimating lens is a graded index lens.

14. The coaxial optical component as set forth in claim 11, wherein the collimating lens is a GRIN lens.

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15. The coaxial optical component as set forth in claim 11, wherein the coaxial optical component is adapted to be used in at least one of:

a power tap;

an add/drop module

a circulator; and

an inline isolator.

16. The coaxial optical component as set forth in claim 11, wherein the metal housing comprises a least one solder hole formed in an extended portion of the metal housing that extends beyond the dual fiber collimator and the spacers, wherein the extended portion is configured to receive a second optical element for use with the dual fiber collimator.

17. The coaxial optical component as set forth in claim 11, wherein the dual fiber pigtail is aligned with the collimating lens to reduce reflection loss.

18. An coaxial optical component as set forth in claim 16, further comprising a single fiber collimator, wherein the single fiber collimator is secured within the extended portion of the housing such that a transmission loss between the single fiber collimator and the dual fiber collimator is reduced.

19. The coaxial optical component as set forth in claim 18, wherein the single fiber collimator is soldered to the metal housing.

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20. An integrated coaxial optical component for use in manufacturing other optical devices, the coaxial optical component comprising:

an optical filter substrate coupled to a collimating lens, wherein the collimating lens comprises a front face and a rear face and wherein the rear face is beveled to an angle;

a dual fiber pigtail attached to the collimating lens with optical epoxy to form a dual fiber collimator, wherein the dual fiber pigtail comprises a pigtail front face and wherein the pigtail front face is beveled at an angle that is parallel to the rear face of the collimating lens, wherein the dual fiber pigtail is adequately aligned with the collimating lens such that a transmission loss is minimized;

a plurality of spacers disposed about the dual fiber collimator;

a metal housing including a first end and a second end, wherein the dual fiber collimator and the plurality of spacers are inserted into the first end of the metal housing such that the plurality of spacers rest against an inside surface of the metal housing, wherein the dual fiber collimator and the plurality of spacers are permanently secured with the first end of the metal housing with epoxy, wherein the second end includes an extended portion that is adapted to receive an optical element.

21. The coaxial optical component as set forth in claim 20, wherein the plurality of spacers are glass.

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22. The coaxial optical component as set forth in claim 20, wherein the collimating lens is one of a graded index lens and a c-lens.

23. The coaxial optical component as set forth in claim 20, wherein the coaxial optical component is adapted to be used in manufacturing at least one of:

a power tap;

an inline isolator;

a three port device; and

an add/drop module.

24. The coaxial optical component as set forth in claim 20, wherein the metal housing comprises a least one solder hole formed in the extended portion of the metal housing.

25. The coaxial optical component as set forth in claim 20, further comprising a second optical element inserted in the extended portion of the metal housing, wherein the second optical element is aligned with the dual fiber collimator.

26. The optical device as set forth in claim 25, wherein the single fiber collimator is soldered to the metal housing.

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27. A coaxial optical component for use in an optical device comprising:

a metal housing having a first end, a second end, and an inside surface configured to receive a plurality of spacers, wherein an outer surface of the plurality of spacers are shaped to rest against the inside surface of the metal housing when the plurality of spacers are inserted within the metal housing; and

a first optical element securely connected within the first end of the metal housing using optical epoxy, wherein the first optical element is disposed within a plurality of spacers such that the first optical element is held against inside surfaces of the plurality of spacers, whereby the first optical element is securely positioned within the first end of the metal housing by the plurality of spacers.

28. The coaxial optical component as set forth in claim 27, wherein the plurality of spacers are glass.

29. The coaxial optical component as set forth in claim 27, wherein the first optical element further comprises:

a collimating element;

an optical filter substrate attached to the collimating element; and

a dual fiber pigtail connected with the collimating element such that a transmission loss between the dual fiber pigtail and the collimating element is minimized.

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30. The coaxial optical component as set forth in claim 27, wherein the second end includes an extended portion adapted to receive a second optical element.

31. The coaxial optical component as set forth in claim 30, wherein the extended portion comprises at least one solder hole.

32. The optical device as set forth in claim 31, wherein the second optical element is a single fiber collimator that is secured to the metal housing using epoxy or solder.

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33. A method for packaging a coaxial optical component for use in fiber optic networks, the method comprising:

forming a first optical element from one or more discrete components, wherein the discrete components are aligned to reduce a transmission loss;

disposing a plurality of spacers around the first optical element such that the first optical element is positioned against inside surfaces of the plurality of spacers;

applying epoxy to the plurality of spacers and the first optical element;

inserting the plurality of spacers and the first optical element within a first end of a metal housing such that outside surfaces of the plurality of spacers are positioned against an inside surface of the metal housing; and

aligning the first optical element within the first end of the metal housing using an alignment control; and

curing the epoxy such that the first optical element and the plurality of spacers are permanently secured within the first end of the metal housing.

34. A method as set forth in claim 33, wherein the first optical element is a dual fiber collimator, further comprising:

attaching an optical filter substrate to a collimating element;

connecting the collimating element with a dual fiber pigtail to form a dual fiber collimator such that a transmission loss of light between the collimating element and the dual fiber pigtail is minimized;

securing the collimating element to the dual fiber pigtail using optical epoxy; and

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securing the plurality of spacers around the a dual fiber collimator using optical epoxy.

35. A method as set forth in claim 33, wherein the metal housing further comprises an extended portion; further comprising securing a second optical element within the extended portion of the metal housing.

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